

NON-PUBLIC?: N
ACCESSION #: 8712140099
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Beaver Valley Power Station Unit 2 PAGE: 1 of 3

DOCKET NUMBER: 05000412

TITLE: Low-Low Steam Generator Reactor Trip - Loss of Condensate Pressure
EVENT DATE: 11/10/87 LER #: 87-035-00 REPORT DATE: 11/23/87

OPERATING MODE: 1 POWER LEVEL: 011

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Mr. William S. Lacey, Plant Manager TELEPHONE #: 412-643-1258

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: SD COMPONENT: PDSV MANUFACTURER: M120
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On 11/10/87, at 2220 hours, with the reactor at 11% power following a startup, an alarm indicating low Condensate Pump Discharge Pressure was received. An attempt was made to correct the problem by opening the Condensate Polishing Bypass Flow Valve (2CNM-DCV100) fully, while reducing flow through the Condensate Polishing Demineralizers. However, the problem persisted, leading at 2223 hours to a trip of the running Main Feedwater Pump (MFP) on Low Suction Pressure. A successful restart of the pump was made as the low pressure condition cleared. The condition shortly returned, however, tripping the MFP again and preventing the start of the other pump. Although both Motor Driven Auxiliary Feedwater Pumps started on the MFP trip, Low-Low Level in the "C" Steam Generator caused a Reactor Trip at 2226 hours. There were no safety implications as all Reactor Protection and Engineered Safeguards Features activated as required to mitigate the consequences of the event. The cause of the low pressure was found to be a bent disc and stem on 2CNM-DCV100, which prevented the nearly closed valve from opening further in response to its demand signal. The valve was replaced by a model with an increased differential pressure rating. The reactor was taken

critical at 0345 hours on 11/12/87.

(End of Abstract)

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At 2220 hours on 11/10/87, with the Unit at 11% reactor power (following a plant startup) and a turbine roll in progress, an alarm was received in the Control Room indicating low Condensate Pump Discharge Pressure. In addition, the third Condensate Pump, normally in standby, automatically started upon sensing the low pressure condition. Since the pressure indicating switch (2CNM-PS106) that generates the alarm signal is located on the Condensate Polishing Demineralizer discharge header, it was judged that the low pressure was being caused by clogging in the demineralizer. Consequently, the Condensate Polishing Bypass Valve (2CNM-DCV100) demand signal was increased to full open, while flow through the in-service demineralizers was throttled shut, in an attempt to direct more of the Condensate Pump discharge flow to the feed pumps.

At 2223 hours, the low pressure alarm cleared. However, it was immediately reinstated and was closely followed by a low Steam Generator Feedwater Pump Suction Header Pressure alarm, which resulted in a trip of the running "A" Main Feedwater Pump (MFP; 2FWS-P21A) at 2224 hours. The two Motor-Driven Auxiliary Feedwater Pumps (AFWPs) immediately started upon the MFP trip as designed. The "A" MFP (2FWS-P21A) was successfully restarted when the low suction alarm was cleared, while an attempt was made to start the "B" MFP (2FWS-P21B). The low MFP suction condition returned at 2225 hours, however, causing 2FWS-P21A to trip again and preventing 2FWS-P21B from starting. Since the feedwater flow being delivered to the Steam Generators was inadequate to maintain the normal level, a Reactor Trip was generated at 2226 hours on 'C' Steam Generator Low-Low Level (15.5%).

The Control Room Operators followed Beaver Valley Unit 2 Emergency Procedure (EOP) E-O "Reactor Trip or Safety Injection" to verify the automatic actuation of the Reactor Protection System. After verifying safety injection was not required, EOP ES-0.1 "Recovery from Reactor Trip" was consulted to stabilize the plant in a HOT STANDBY (Mode 3) condition.

There were no safety implications resulting from this trip because all Reactor Protection Systems (RPS) and Engineered Safeguards Features (ESF) equipment actuated at their proper setpoints in

response to valid signals. Specifically, the reactor tripped upon the Low-Low Steam Generator Level to shutdown the heat source in anticipation of a loss of heat sink. In addition, the Motor Driven AFWPs started upon the loss of 2FWS-P21A, while the Turbine Driven AFWP started upon the Low-Low "C" Steam Generator Level. Only one (1) anomaly was noted during the Trip recovery. One of

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the AFWP Discharge Throttle Valves to the "C" Steam Generator (2FWE-FCV100A) did not respond to its benchboard control. However, the valve had failed in its safe (open) position, which permitted auxiliary feedwater to reach the generator as required. Therefore, the consequences of this event were mitigated in accordance with the analysis of Section 15.2.7, "Loss of Normal Feedwater", in the Beaver Valley Unit 2 Final Safety Analysis Report. The NRC was notified on the Emergency Notification System (ENS) Red Phone at 0010 hours on 11/11/87, in accordance with the four-hour provision of 10 CFR 50.72.b.2.ii. This written report is submitted under 10 CFR 50.73.a.2.iv.

The cause of the loss of pressure was found to be a failure of Condensate Polishing Bypass Valve 2CNM-DCV100. The valve (a Masoneilan Model 71-32112) was found to have a bent disc and stem, which prevented the almost fully closed valve from opening further in response to its demand signal. This failure thus caused a loss of flow and pressure past 2CNM-PS106. The actions taken to restrict demineralizer flow aggravated the situation. It was determined that the valve was inadequately rated to withstand Condensate Polishing System differential pressure for a long period of time. Therefore, to prevent similar future recurrences of the problem, 2CNM-DCV100 was replaced by a Masoneilan 69-32200 valve with a greater differential pressure rating (665 psid instead of 50 psid) under a Work Authorization Request (WAR) on 11/12/87, and calibrated in accordance with Calibration Procedure 2-CP-508 on 11/13/87. The 2FWE-FCV100A failure was found to have been caused by a blown control fuse which was replaced on 11/12/87.

The reactor had, in the meantime, been taken critical at 0345 hours on 11/12/87.

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Duquesne Light Telephone (412) 393-6000

Nuclear Group
P.O. Box 4
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December 10, 1987
ND3SPM:0115

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 87-035-00

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 87-035-00, 10 CFR 50.73.a.2.iv, "Reactor Trip on Low-Low Steam Generator Level - Loss of Condensate Pressure".

Very truly yours,
/s/ T. P. Norman
for Wm. S. Lacey
Plant Manager

tlu

Attachment

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